

LISTING OF CLAIMS

Claims 1-3 (Cancelled).

Claim 4 (Previously Presented) A liquid chemical delivery system for use with a supply container, comprising:

a controller;

a buffer reservoir with a chemical output, a main reservoir capable of receiving chemical from the supply container, a reservoir valve connecting the buffer reservoir to the main reservoir, a load cell coupled to the main reservoir and to the controller, operable to weigh the liquid in the main reservoir;

a supply line having a valve coupled to the controller and to the supply container and to the main reservoir;

means for delivering the liquid from the chemical output and refilling the main reservoir with chemical when demanded by the controller based on signals from the load cell.

Claim 5 (Currently Amended) The system of claim 4 wherein the means for delivering the liquid from the chemical output and refilling the main reservoir includes a first gas line connected to the buffer reservoir, a second gas line connected to the main reservoir, a gas source connected to the first and second gas lines, a vacuum source, a vacuum line connecting the vacuum source to the second gas line, a gas valve connecting the second gas line, the gas source, and the vacuum source, wherein the controller ~~opens~~ is adapted to send a signal to the gas valve to permit gas to flow from the gas source to the main reservoir when liquid is delivered ~~withdrawn~~ from the main reservoir-chemical output and to send a signal to the gas valve to generate a vacuum in the main reservoir when the main reservoir is refilled from the supply container.

Claim 6 (Previously Presented) The system of claim 4 wherein the controller closes the reservoir valve when the main reservoir is refilled and liquid is delivered from the buffer reservoir such that the buffer reservoir undergoes no negative pressure from the vacuum in the main reservoir.

Claim 7 (Previously Presented) A liquid chemical delivery system for use with a supply container, comprising:

a controller;

a buffer reservoir with a chemical output, a main reservoir capable of receiving chemical from the supply container, a reservoir valve connecting the buffer reservoir to the main reservoir, a load cell coupled to the buffer reservoir and to the controller, operable to weigh the liquid in the buffer reservoir;

a supply line having a valve coupled to the controller and to the supply container and to the main reservoir;

means for delivering the liquid from the chemical output and refilling the main reservoir with chemical when demanded by the controller based on signals from the load cell.

Claim 8 (Currently Amended) The system of claim 7 wherein the means for delivering the liquid from the chemical output and refilling the main reservoir includes a first gas line connected to the buffer reservoir, a second gas line connected to the main reservoir, a gas source connected to the first and the second gas lines, a vacuum source, a vacuum line connecting the vacuum source to the second gas line, a gas valve connecting the second gas line, the gas source, and the vacuum source, wherein the controller ~~opens~~ is adapted to send a signal to the gas valve to permit gas to flow from the gas source to the main reservoir when liquid is ~~withdrawn~~ delivered from the ~~main reservoir~~ chemical output and to send a signal to the gas valve to generate a vacuum in the main reservoir when the main reservoir is refilled from the supply container.

Claim 9 (Previously Presented) The system of claim 7 wherein the controller closes the reservoir valve when the main reservoir is refilled and liquid is delivered from the buffer reservoir such that the buffer reservoir undergoes no negative pressure from the vacuum in the main reservoir.

Claim 10 (Previously Presented) A liquid chemical delivery system for use with a supply container, comprising:

a controller;

a buffer reservoir with a chemical output, a main reservoir capable of receiving chemical from the supply container, a reservoir valve connecting the buffer reservoir to the main reservoir, a first load cell coupled to the main reservoir and to the controller, operable to weigh the liquid in the main reservoir;

a second load cell coupled to the buffer reservoir and to the controller, operable to weigh the liquid in the buffer reservoir, a supply line having a valve coupled to the controller and to the supply container and to the main reservoir; and

means for delivering the liquid from the chemical output and refilling the main reservoir with chemical when demanded by the controller based on signals from the first and the second load cells.

Claim 11 (Currently Amended) The system of claim 10 wherein the means for delivering the liquid from the chemical output and refilling the main reservoir includes a first gas line connected to the buffer reservoir, a second gas line connected to the main reservoir, a gas source connected to the first and second gas lines, a vacuum source, a vacuum line connecting the vacuum source to the second gas line, a gas valve connecting the second gas line, the gas source, and the vacuum source, wherein the controller ~~opens~~ is adapted to send a signal to the gas valve to permit gas to flow from the gas source to the main reservoir when liquid is ~~withdrawn~~ delivered from the main reservoir ~~chemical output~~ and to send a signal to the gas valve to

generate a vacuum in the main reservoir when the main reservoir is refilled from the supply container.

Claim 12 (Previously Presented) The system of claim 10 wherein the controller closes the reservoir valve when the main reservoir is refilled and liquid is delivered from the buffer reservoir such that the buffer reservoir undergoes no negative pressure from the vacuum in the main reservoir.

Claim 13 (Currently Amended) A liquid chemical delivery system comprising:

- a) an upstream delivery system portion comprising a main reservoir for containing the liquid chemical, ~~and a first measuring means for measuring the amount of liquid chemical contained therein~~ and main reservoir refill means for refilling the main reservoir;
- b) downstream delivery system portion comprising a buffer reservoir having an optional second measuring means located intermediate the main reservoir and a delivery site and for receiving the liquid chemical from the main reservoir and delivering the liquid chemical to the delivery site wherein the downstream delivery portion is adapted to deliver liquid chemical to the delivery site while the main reservoir refill means refills the main reservoir; and
- c) control means for precisely controlling the flow of the liquid chemical from the main reservoir to the delivery site.

Claim 14 (Previously Presented) The liquid chemical delivery system of claim 13 further comprising first delivery means for delivering the liquid chemical from the delivery site to a target wherein the target is adapted to receive a preselected amount of the liquid chemical.

Claim 15 (Previously Presented) The liquid chemical delivery system of claim 13 wherein the flow of the liquid chemical from the main reservoir to the delivery site is continuous.

Claim 16 (Previously Presented) The liquid chemical delivery system of claim 13 wherein the control means comprises first pressure regulation means for regulating a pressure condition in the buffer reservoir sufficient to deliver the liquid chemical to the delivery site in said controlled manner.

Claim 17 (Withdrawn – Previously Presented) The liquid chemical delivery system of claim 16 wherein the control means comprises second pressure regulating means for regulating a pressure condition in the main reservoir for delivering the liquid chemical to the delivery site in cooperation with the first pressure regulating means in said controlled manner.

Claim 18 (Previously Presented) The liquid chemical delivery system of claim 14 wherein the target is adapted to receive a constant flow of the liquid chemical.

Claim 19 (Previously Presented) The liquid chemical delivery system of claim 16 wherein the pressure condition in the buffer reservoir is a constant pressure.

Claim 20 (Withdrawn – Previously Presented) The liquid chemical delivery system of claim 16 wherein the first pressure regulating means comprises sealing means for sealing the downstream delivery system portion from the upstream delivery system portion.

Claim 21 (Cancelled)

Claim 22 (Previously Presented) The liquid chemical delivery system of claim 13 wherein the first and second measuring means is at least one load cell.

Claim 23 (Previously Presented) The liquid chemical delivery system of claim 22 wherein the control means comprises signal generating means for generating a first signal corresponding to the amount of liquid chemical measured by the load cell, and signal detecting means for detecting the first signal and generating a second signal therefrom for operating the first and second pressure regulating means.

Claim 24 (Previously Presented) The liquid chemical delivery system of claim 16 wherein the first pressure regulating means comprises first gas supply means for supplying a gas to the buffer reservoir.

Claim 25 (Withdrawn - Previously Presented) The liquid chemical delivery system of claim 17 wherein the second pressure regulating means comprises second gas supply means for supplying a gas to the main reservoir.

Claim 26 (Previously Presented) The liquid chemical delivery system of claim 13 further comprising means for identifying trends in chemical usage based on the amount of liquid chemical delivered from the main reservoir.

Claim 27 (Previously Presented) The liquid chemical delivery system of claim 22 wherein the at least one load cell is operatively connected to at least one of the main reservoir and the buffer reservoir.

Claim 28 (Previously Presented) The liquid chemical delivery of claim 22 wherein the at least one load cell is operatively connected to the main reservoir.

Claim 29 (Currently Amended) The liquid chemical delivery system of claim 13 wherein the control means maintains the weight of chemical in the buffer reservoir while the amount of liquid chemical in the main reservoir decreases to a predetermined amount, said control means ~~comprising adapted to initiate main reservoir refill means for initiating~~ refill of the main reservoir when the liquid chemical in the main reservoir reaches the predetermined amount by sending a signal to the main reservoir refill means.

Claim 30 (Previously Presented) A liquid chemical delivery system comprising:

a multi-reservoir load cell assembly, including a main reservoir, a buffer reservoir, and a load cell;

a logic device coupled to the load cell(s) providing output signals to actuate:

means for sealing and unsealing the buffer reservoir from the main reservoir wherein sealing corresponds to a first mode of operation of refilling the main reservoir and wherein unsealing corresponds to a second mode of operation of not refilling the main reservoir, and

a gas source supplying the main reservoir to blanket the liquid chemical in the main reservoir.

Claim 31 (Previously Presented) A liquid chemical delivery system, comprising:

a multi-reservoir load cell assembly, including a main reservoir with a load cell;

a buffer reservoir;

means for sealing and unsealing the buffer reservoir from the main reservoir;

means for receiving a first liquid chemical in the main reservoir until the multi-reservoir load cell assembly determines the main reservoir has a sufficient amount of the first liquid chemical;

means for receiving a second liquid chemical in the main reservoir until the multi-reservoir load cell assembly determines the main reservoir has a sufficient amount of the second liquid chemical; and

wherein the system is adapted to transport the first liquid chemical and the second liquid chemical from the main reservoir to the buffer reservoir.

Claim 32 (Previously Presented) A liquid chemical delivery system for use with a supply container, comprising:

a controller;

a multi-reservoir load cell assembly, including, a buffer reservoir with a chemical output, a main reservoir in fluid communication with the buffer reservoir, and a load cell, coupled to the assembly and to the controller, operable to weigh the liquid in the reservoir assembly;

a supply line having a valve coupled to the controller and to the supply container and to the main reservoir; and

means for delivering the liquid from the chemical output and refilling the main reservoir from the supply container when demanded by the controller based on signals from the load cell.

Claim 33 (Previously Presented) The system of claim 32 wherein the means for delivering the liquid from the chemical output and refilling the main reservoir from the supply container includes a gas line connected to the main reservoir, a gas source connected to the gas line, a vacuum source, a vacuum line connecting the vacuum source to the gas line, a gas valve connecting the gas line, the gas source, and the vacuum source, wherein the controller ~~opens~~ is adapted to send a signal to the gas valve to permit gas to flow from the gas source to the main reservoir when liquid is ~~withdrawn~~ delivered from the ~~main reservoir~~ chemical output and to send a signal to the gas valve to generate a vacuum in the main reservoir when the main reservoir is refilled from the supply container.

Claim 34 (Previously Presented) The system of claim 32 further including a reservoir valve connecting the buffer reservoir to the main reservoir for opening and closing fluid communication between the main reservoir and the buffer reservoir, and wherein the controller closes the reservoir valve when the main reservoir is refilled and liquid is delivered from the



chemical output such that the buffer reservoir undergoes no negative pressure from a vacuum in the main reservoir.

Claim 35 (Currently Amended) A chemical delivery system, comprising:

a multi-reservoir load cell assembly comprising a main reservoir capable of fluid communication with a buffer reservoir and a first load cell for weighing the assembly and generating an output signal indicative of the weight; and

means, responsive to the output signal, for ~~adjusting the pressure in~~ evacuating the main reservoir and adjusting pressure in the buffer reservoir and for calculating the amount of chemical in the assembly.

Claim 36 (Previously Presented) The system of claim 35 wherein the means responsive to the output signal is adapted to control fluid communication between the main reservoir and the buffer reservoir.

Claim 37 (Previously Presented) The system of claim 36 wherein the first load cell generates an output signal proportional to the weight of the chemical in the main reservoir.

Claim 38. (Previously Presented) The system of claim 35 wherein the first load cell generates an output signal proportional to the weight of the chemical in the main reservoir.

Claim 39 (Previously Presented) The system of claim 36 wherein the first load cell generates an output signal proportional to the weight of the chemical in the buffer reservoir.

Claim 40 (Previously Presented) The system of claim 35 wherein the first load cell generates an output signal proportional to the weight of the chemical in the buffer reservoir.

Claim 41 (Previously Presented) A method for refilling a multi-reservoir load cell assembly having a main reservoir capable of fluid communication with a buffer reservoir, a load cell for

weighing the assembly and generating an output signal indicative of the weight, means, responsive to the output signal, for adjusting the pressure in the main reservoir and in the buffer reservoir and for calculating the amount of chemical in the assembly wherein the means responsive to the output signal includes means for refill of the assembly with the chemical when the weight of chemical drops to a predetermined amount, the method comprising the steps of:

- a) isolating the main reservoir from fluid communication with the buffer reservoir,
- b) reducing the gas pressure in the main reservoir to draw the chemical into the main reservoir until the chemical rises to a predetermined amount,
- c) increasing the gas pressure in the main reservoir, and
- d) opening fluid communication between the main reservoir and the buffer reservoir to allow the chemical in the main reservoir to flow into the buffer reservoir.

Claims 42-43 (Cancelled)

Claim 44 (Previously Presented) A method for refilling a multi-reservoir load cell assembly, including a main reservoir with a gas inlet, a liquid inlet, and a liquid outlet, and a buffer reservoir with a gas inlet and a liquid inlet, at least one load cell for weighing the chemical contained in the assembly and generating an output signal indicative of the weight, a valve connecting the main reservoir liquid outlet and the buffer reservoir liquid inlet, a valve connecting the main reservoir gas inlet and the buffer reservoir gas inlet, means, responsive to the output signal, for refilling the buffer reservoir with chemical when the output signal indicates chemical in the buffer reservoir has dropped to a predetermined level, the method comprising the steps of:

closing the valve connecting the main reservoir liquid outlet and the buffer reservoir liquid inlet to isolate the main reservoir from fluid communication with the buffer reservoir,

opening the valve connecting the main reservoir gas inlet and the buffer reservoir gas inlet to evacuate the main reservoir to draw liquid chemical into the main reservoir until the liquid chemical rises to a predetermined level,

opening the valve connecting the main reservoir liquid outlet and the buffer reservoir liquid inlet to allow the liquid chemical in the main reservoir to flow into the buffer reservoir.

Claim 45 (Previously Presented) A liquid chemical delivery system for use with a chemical supply source, comprising:

a multi-reservoir load cell assembly, including a main reservoir, a buffer reservoir, and at least one load cell;

a logic device coupled to the load cell providing output signals to actuate:

means for sealing and unsealing the buffer reservoir from the main reservoir,

a vacuum generator for evacuating the main reservoir to draw liquid chemical from the chemical supply source into the main reservoir, and

a gas pressure source to pressurize the main reservoir.

Claim 46 (Withdrawn - Previously Presented) The system of claim 45, wherein the means for sealing and unsealing includes a shaft or valve disposed between the main reservoir from the buffer reservoir.

Claim 47 (Previously Presented) The system of claim 45 wherein the at least one load cell comprises a first load cell and a second load cell for generating first signals and second signals

indicative of the weight of the main reservoir and the buffer reservoir wherein the load cell is adapted to send the first signals and second signals to the logic device.

Claim 48 (Previously Presented) The system of claim 45 wherein the logic device is adapted to monitor the weight of the buffer reservoir so that if the rate of liquid chemical consumption will empty the buffer reservoir before the refill is complete, the system can stop refill and/or transport liquid chemical from the main reservoir to the buffer reservoir to prevent emptying the buffer reservoir.

Claim 49 (Previously Presented) The system of claim 45 further comprising means for flexibly connecting the buffer reservoir to a main valve at the main reservoir and suspending the buffer reservoir from the main reservoir.

Claim 50 (Previously Presented) The system of claim 47 further comprising means for starting refill when the second load cell detects the weight of the buffer reservoir is decreasing.

Claim 51 (Previously Presented) A system for combining a first liquid chemical and a second liquid chemical, and delivering the combination, comprising:

a multi-reservoir load cell assembly, including a main reservoir with a load cell;

a buffer reservoir;

means for sealing and unsealing the buffer reservoir from the main reservoir;

means for supplying a first liquid chemical to the main reservoir until the multi-reservoir load cell assembly determines the main reservoir has a sufficient amount of the first liquid chemical;

means for supplying a second liquid chemical to the main reservoir until the multi-reservoir load cell assembly determines the main reservoir has a sufficient amount of the second liquid chemical; and

wherein the system is adapted to transport the combination of the first liquid chemical and the second liquid chemical from the main reservoir to the buffer reservoir.